

Remarks:

Applicants respectfully solicit favorable reconsideration and an allowance. The Office Action summary page lists claims 1-63 as pending. Applicants present claims 1-54 and 58-59, 61-62 and 64. Claims 55-57 were previously canceled in the prior Amendment. Claims 58 and 61 as amended are consistent with the original specification and thereby avoid new matter. Claims 60 and 63 are canceled with this amendment. New claim 64 finds basis in the original specification throughout, including page 5, line 28 to page 6, line 11.

Applicants acknowledge with appreciation that claims 49-54 are allowed.

Entry of this Amendment is courteously solicited. The total number of claims has been reduced. Amended claims 58 and 61 are presented in an effort to reduce issues as discussed hereinbelow in (6). New claim 64 is offered consistent with the specification and Applicants' arguments of record whereby there is no new issue and there is no new matter.

(1) Applicants traverse the rejection of claims 1-7, 19-32, 48 and 57 under 35 U.S.C. 102(a) over U.S. Patent No. 5,137,980 to DeGonia in view of U.S. Patent No. 6,107,258 to Esche.

Claim 1 recites "an amination product of a hydrocarbyl substituted succinic acylating agent and a mixture comprising an aliphatic polyamine and an aromatic polyamine," and that mixture does not appear to be described or suggested by the DeGonia patent or the Esche patent.

On the other hand, the present Office Action states "DeGonia and Esche disclose the reaction products of succinic acylating agents and polyamine mixtures." Office Action, June 19, 2007, p. 3 (emphasis added). Applicants courteously request reconsideration of the references because neither the DeGonia nor the Esche references support the assertion in the Office Action.

As to DeGonia, there is no disclosure of a mixture of polyamines comprised of aromatic polyamines and aliphatic polyamines. The Office Action's reliance on DeGonia at column 18, lines 35-48 is misplaced as DeGonia does not describe "an amination product of a hydrocarbyl substituted succinic acylating agent and a mixture comprising an aliphatic polyamine and an aromatic polyamine."

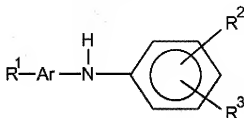
DeGonia states the most preferred amines are the ethylene polyamines depicted by a formula (V) at column 20, line 18 *et seq.* and see also, column 20 at lines 51-58. DeGonia leads a person of ordinary skill in the art to the most preferred amines, ethylene polyamines, and that direction amounts to a teaching away from preparing "a mixture comprising an aliphatic polyamine and an aromatic polyamine" and using that mixture to in a reaction with a hydrocarbyl substituted succinic anhydride to obtain the amination product, such as in claim 1.

Although discussed below in more detail as to claims 6, 24 and 31, Applicants submit Esche does not disclose and would not have provided direction or reason to use "a mixture comprising an aliphatic polyamine and an aromatic polyamine" and to react it with a hydrocarbyl substituted succinic anhydride to obtain the amidation product, such as in claim 1.

Applicants respectfully suggest that claim 64 is neither disclosed in nor suggested by either DeGonia or Esche, even if, *arguendo*, they were taken in combination.

Claim 1 also recites that "the molar ratio of aliphatic polyamine to aromatic polyamine in the mixture ranges from about 10:0.1 to about 0.1:10, and wherein the amination product contains at least about 0.1 molar equivalent of the polyamine mixture to 1 molar equivalent of the hydrocarbyl substituted succinic acylating agent." Again, neither the DeGonia nor the Esche patents appear to describe or suggest the "mixture," and neither therefore describes the "molar ratio" or that the "amidation product contains at least about 0.1 molar equivalent of the polyamine mixture to 1 molar equivalent of the hydrocarbyl substituted succinic acylating agent."

More particularly as to the rejected claims, as exemplified by claims 6, 24, and 31, Applicants respectfully submit that neither DeGonia nor Esche, even if combined, would have suggested (1) "A multi-functional composition for use as an additive for fuels and lubricants comprising an amination product of a hydrocarbyl substituted succinic acylating agent and a mixture comprising an aliphatic polyamine and an aromatic polyamine..." wherein "the aromatic polyamine comprises a compound selected from the group consisting of N-phenyl-phenylenediamine, N-naphthyl-phenylene diamine, and substituted aromatic polyamines of the structure:



wherein Ar is an aromatic group, R¹ is selected from the group consisting of —NH₂, —NH-aryl-NH₂, —NH-aryl-alkyl-NH₂, —NH-alkyl-NH₂, or aminoalkyl wherein alkyl is a branched or straight chain radical having 4 to 24 carbon atoms, and R² is selected from the group consisting of —NH₂, —NH(CH₂)_n)_mNH₂, —CH₂-(CH₂)_n-NH₂, and —aryl-NH₂, in which n and m have a value of from 1 to 10, and R³ is selected from the group consisting of —H, alkyl, alkenyl, alkoxy, arylalkyl, and alkaryl having 4 to 24 carbon atoms and with the proviso that only one of R² and R³ has a terminal NH₂ group [claim 6, as an example]."

According to the December 1, 2006 Office Action at p. 4, "DeGonia does not teach the specific aromatic polyamines recited in claims 6, 24 and 31, nor does DeGonia give motivation to specifically using aromatic polyamines along with aliphatic polyamines in the amine mixture."

Esche does not describe and thus would not have provided reason nor would it have suggested using a mixture of aromatic and aliphatic polyamines in an amine mixture reacted with a hydrocarbyl substituted succinic acylating agent.

Indeed, at column 1, lines 25-27, Esche plainly says the acylated olefin

copolymers, either before or after reaction with the coupling compound, are reacted with a performance enhancing compound or compounds. The coupling compound and the alleged performance enhancing compound are different, and are reacted at different times. Reacting *before* with just an alleged performance enhancing compound means the compound is not the same as reacting with the mixture as in the present claims. Reacting *after* is not the same as reacting with the mixture as in the present claims. Esche does **not** say to use a mixture, or to use a mixture of aliphatic polyamine and aromatic polyamine in reaction with a hydrocarbyl substituted succinic acylating agent.

Esche reports an acylated olefin copolymer that can be reacted with an amine, such as at column 4, lines 37-50, as mentioned in the Office Action, but there is no mixture of an aliphatic amine and aromatic amine at column 4, lines 37-50.

Esche mentions performance enhancing compounds at column 8, lines 1-16, as mentioned in the Office Action, but again nowhere does Esche provide reason or motivation to use a mixture of aliphatic amine and aromatic amine in reaction with a hydrocarbyl substituted succinic acylating agent.

Applicants acknowledge the Office Action's reliance on Esche's claim 7 but courteously submit it does not appear to provide factual support for the thesis advanced in the Office Action. The thesis seems inconsistent with Esche's specification.

In short, DeGonia and Esche, even if combined, would not have led a person of ordinary skill to the present claimed inventions.

(2) Applicants respectfully submit their claims 9-18 define unobvious inventions over DeGonia and Esche plus Tipton.

DeGonia and Esche do not disclose nor would they have led to an amination product of a hydrocarbyl substituted succinic acylating agent and a mixture comprising an aliphatic polyamine and an aromatic polyamine.

A combination of DeGonia and Esche "does not disclose the method of reacting the components recited in claim 9." Office Action, December 1, 2006, p. 5.

The Tipton reference is apparently cited with special reliance on its Examples B-3 and B-4 at column 22, as seen from the December 1, 2006 Office Action at p. 5, apparently because the Examples are silent regarding the use of a surfactant.

There is, however, apparently no disclosure of a mixture of aliphatic and aromatic polyamines in Tipton's Example B-3. Example B-3 refers to "reacting 1000 parts of ethylene polyamine bottoms and 591 parts tris-hydroxymethylaminomethane ..." The polyamine bottoms apparently are apparently a mixture of polyalkylenepolyamines, which may comprise small amounts of lower polyamine oligomers. The "591 parts tris-hydroxymethylaminomethane" does not describe nor suggest an aromatic polyamine. Even if a mixture is implied, it is only a 'mixture' of non-aromatic amines.¹

There is, however, apparently no disclosure of a mixture of aliphatic and aromatic polyamines in Tipton's Example B-4. Example B-4 refers in passing to "27.7 parts of polyamine bottoms having an equivalent weight of 40.5 (HPA-Z, Union Carbide)." The polyamine bottoms apparently are a mixture of polyalkylenepolyamines that may comprise small amounts of lower polyamine oligomers. Again, as with Example B-3, even if a mixture is implied, it is only a 'mixture' of non-aromatic amines.

Therefore, even if a person of ordinary skill in the art practiced the DeGonia and Esche patents with the procedure according to Tipton's Examples B-3 or B-4, the resultant reaction product would not have been according to claim 1 or claims 9-18.

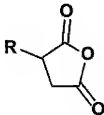
¹ The similar conclusion follows as to the preferred amines according to column 19, lines 5-9 as being triethyleneamine (TETA), tetraethylenepentamine (TEPA), pentaethylenhexamine (PEHA), and mixtures of polyamines such as the above-described amine bottoms." Tipton again does not appear to support the rejection.

(3) Applicants respectfully submit their claims 41-47 define novel, unobvious inventions over DeGonia and Esche taken in view of Lambert (U.S. Patent No. 5,888,947).

Claims 44-47 depend directly or indirectly from claim 41, which provides for "A method for lubricating moving parts comprising contacting the moving parts with a lubricant composition containing a lubricant and a lubricant additive, the lubricant additive comprising an amination product of a hydrocarbyl substituted succinic acylating agent and a mixture containing an aliphatic polyamine and an aromatic polyamine, wherein the molar ratio of aliphatic polyamine to aromatic polyamine in the mixture ranges from about 10:0.1 to about 0.1:10, and wherein the amination product contains at least about 0.1 molar equivalent of the polyamine mixture to 1 molar equivalent of the hydrocarbyl substituted succinic acylating agent."

DeGonia does not teach a method for lubricating moving parts with the lubricant. Office Action, December 1, 2006, p. 6.

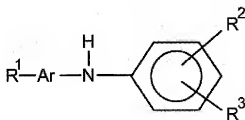
DeGonia and Esche do not describe or teach "an amination product of a hydrocarbyl substituted succinic acylating agent and a mixture containing an aliphatic polyamine and an aromatic polyamine," as in claim 1 for the reasons stated hereinabove. Since they do not provide incentive, reason, or motivation towards claim 1, it follows that they would not have suggested an amination product of a hydrocarbyl substituted succinic acylating agent comprising a compound of the structure:



wherein R comprises a hydrocarbyl group having a number average molecular weight as determined by gel permeation chromatography ranging from about 200 to about 10,000, with "a mixture containing an aliphatic polyamine and an aromatic

polyamine" as in claim 44, or a sub-genus where R is PIB as in claim 45.

Since DeGonia and Esche do not disclose, do not provide reason for, nor teach the mixture of aliphatic polyamine and aromatic polyamine, they do not teach such a mixture in which the aromatic polyamine comprises a compound selected from the group consisting of N-phenyl-phenylenediamine, N-naphthyl-phenylene diamine, and substituted aromatic polyamines of the structure



wherein Ar is an aromatic group, R^1 is selected from the group consisting of $-\text{NH}_2$, $-\text{NH-aryl-NH}_2$, $-\text{NH-aryl-alkyl-NH}_2$, $-\text{NH-alkyl-NH}_2$ or aminoalkyl wherein alkyl is a branched or straight chain radical having 4 to 24 carbon atoms, and R^2 is selected from the group consisting of $-\text{NH}_2$, $-\text{NH}(\text{CH}_2)_n)_m\text{NH}_2$, $-\text{CH}_2-(\text{CH}_2)_n\text{NH}_2$, and $-\text{aryl-NH}_2$, in which n and m have a value of from 1 to 10, and R^3 is selected from the group consisting of $-\text{H}$, alkyl, alkenyl, alkoxy, arylalkyl, and alkaryl having 4 to 24 carbon atoms and with the proviso that only one of R^2 and R^3 has a terminal NH_2 group, as in claim 47.

Since DeGonia and Esche do not teach "an amination product of a hydrocarbyl substituted succinic acylating agent and a mixture containing an aliphatic polyamine and an aromatic polyamine," as in claim 41, they do not teach a molar ratio of acylating agent to amino groups in the polamine mixture in the range from about 1:1 to about 6:1 as in claim 46.

(4) Applicants respectfully submit their claims 8 and 33-40 define unobvious inventions under 35 U.S.C. 103(a) over DeGonia in view of Esche and Lambert further in view of Galka (U.S. Patent No. 6,427,647).

Applicants' claim 8 defines a novel and unobvious method. Claim 8 provides "A vehicle having moving parts and containing a lubricant for lubricating the moving

parts, the lubricant comprising an oil of lubricating viscosity and from about 0.1 to 10 wt. %, based on the total weight of the lubricant composition, of the amination product of claim 1."

DeGonia and Esche do not disclose, suggest, provide incentives or reason leading to the "amination product of claim 1" for the reasons discussed hereinabove.

DeGonia and Esche do not disclose, suggest, provide incentives or reasons leading to "A vehicle having moving parts and... lubricating the moving parts....."

Adding Lambert and Galka therefore would not have provided disclosure of the "amidation product of claim 1" even if, *arguendo*, they disclose lubricating moving parts.

In short, Applicants respectfully request the Examiner to reconsider and withdraw this rejection.

(5) Applicants courteously suggest the rejection of claim 55 and claim 56 is moot, but without prejudice or disclaimer.

(6) Applicants courteously submit claim 58-59 and 61-62 find support in the application as filed. The reaction product as defined in amended claims 58 and 61 finds basis in the application and therefore Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §112(¶1). Claims 60 and 63 have been canceled without prejudice or disclaimer simply to reduce the total number of claims presented.

Conclusion

Applicants respectfully solicit favorable reconsideration and a Notice of Allowance for claims 1-54, 58-59, 61-62 and 64.

Respectfully submitted,

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